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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/765,952	01/29/2004	Shunpei Yamazaki	07977-247002	2326

26171 7590 09/26/2006

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EXAMINER
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BOOTH, RICHARD A

ART UNIT	PAPER NUMBER
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2812

DATE MAILED: 09/26/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/765,952

Applicant(s)

YAMAZAKI ET AL.

Examiner

Richard A. Booth

Art Unit

2812

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 10 July 2006.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 37-48 and 61 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 37-48 and 61 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
  2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)            | 4) <input type="checkbox"/> Interview Summary (PTO-413)           |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | Paper No(s)/Mail Date. _____                                      |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application |
| Paper No(s)/Mail Date <u>0706</u> .  | 6) <input type="checkbox"/> Other: _____                          |

## DETAILED ACTION

### ***Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

Claims 37-44, 46-48, and 61 are rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki et al., U.S. Patent 5,821,138 or Yamazaki et al., JP 08-288522 in view of Yoshikazu, JP 08-293598.

Yamazaki et al. shows the invention substantially as claimed including a method of making a semiconductor device, comprising the steps of: forming a crystalline semiconductor film over an insulating surface, wherein said crystalline semiconductor film forming step comprises the steps of: forming an amorphous semiconductor film 304 over said insulating surface; holding catalytic elements 305 that promote the crystallization of said amorphous semiconductor film on said amorphous semiconductor film; crystallizing said amorphous semiconductor film through a heat treatment to transform said amorphous semiconductor film into a crystalline semiconductor film (see fig. 11C); and gettering said catalytic elements remaining in said crystalline semiconductor film to a processing atmosphere through a heat treatment in an atmosphere containing halogen elements therein (see fig. 11D); and introducing elements from group XV into the semiconductor layer in order to form a source and drain region (see fig. 2A and col. 8-lines 43-56, and col. 15-line 39 to col. 18-line 50).

Both Yamazaki et al. references fail to disclose adding impurity elements that shift an energy band of said crystalline semiconductor film to a portion of said crystalline semiconductor film which will come to an active region later to locally form an impurity region; wherein said impurity region is formed so as to extend between source and drain regions, and at least two channel regions are separated from each other by said impurity region.

Yoshikazu discloses adding impurity elements that shift an energy band of said crystalline semiconductor film to a portion of said crystalline semiconductor film which will come to an active region later to locally form an impurity region; wherein said impurity region is formed so as to extend between source and drain regions, and at least two channel regions are separated from each other by said impurity region (see abstract and figures). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of the Yamazaki et al. references so as to form the impurity region of Yoshikazu because in such a way a channel region having multiple threshold voltages can be fabricated in a single photolithographic step.

Concerning the particular order of the gettering and introduction of elements, the selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results.

Regarding the concentration of impurities, generally, differences in concentration or temperature will not support the patentability of subject matter encompassed by the prior art unless there is evidence indicating such concentration or temperature is critical.

Claim 45 is rejected under 35 U.S.C. 103(a) as being unpatentable over Yamazaki et al., U.S. Patent 5,821,138 or Yamazaki et al., JP 08-288522 in view of Yoshikazu, JP 08-293598 as applied to claims 37-44, 46-48, and 61 above, and further in view of Singh et al., U.S. Patent 5,843,811.

Yamazaki et al. '138 and '522 and Yoshikazu are applied as above but do not expressly disclose the face of the semiconductor film being (110).

Singh et al. discloses the face of a semiconductor film being (110) (see col. 3-lines 55-64). In view of this disclosure, it would have been obvious to one of ordinary skill in the art at the time the invention was made to modify the process of Yamazaki et al. '138 and '522 and Yoshikazu so as to have the claimed semiconductor face because forming the semiconductor with such a face produces a film with high mobility.

### ***Response to Arguments***

Applicant's arguments with respect to claims 37-48 and 61 have been considered but are moot in view of the new ground(s) of rejection.

### ***Conclusion***

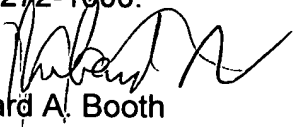
Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Richard A. Booth whose telephone number is (571) 272-1668. The examiner can normally be reached on Monday-Thursday from 7:30-6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Michael Lebentritt can be reached on (571) 272-1873. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.



Richard A. Booth  
Primary Examiner  
Art Unit 2812

September 17, 2006